LANGUAGE ARTS TOPICS – GRADES K-3

SPELLING

1. Identify letter sounds.
2. Distinguish likenesses and differences in letter forms.
3. Associate sounds with symbols.
4. Arrange words in alphabetical order with the 1st, 2nd, & 3rd letter.
5. Memorize and write assigned words correctly.
6. Identify compound words, base words, homonyms, antonyms, synonyms, and contractions, prefixes and suffixes.
7. Identify and use word endings correctly.
8. Apply word attack skills to spelling.
9. Use dictionary skills.

GRAMMAR

1. Produce, orally and in writing, basic sentence patterns.
2. Expand basic sentence patterns with words and phrases.
3. Develop basic sentences into interrogative, imperative & declarative forms.
4. Use regular verb forms correctly in writing or speaking.
5. Recognize the changing nature of language.

LITERATURE

1. Recognize through stories & poems the experiences & emotions of other people.
2. Articulate emotional reactions and motives of story characters.
3. Communicate ideas, concepts and feelings through creative dramatics.
4. Choose to read various types of material on a variety of subjects.
5. Recognize characteristics of nursery rhymes, fanciful stories & poetry.
6. Recognize parts of books.
7. Make choices which indicate an appreciation of good literature through an awareness of authors, illustrators, publishers and interests.
8. Pursue an independent interest for pleasure reading.
9. Orally participate in a variety of literary forms.
10. Interpret pictures.
11. Name common elements of story.
12. Retell favorite stories and poems.
13. Identify non-stereotyped and non-biased literature.

MEDIA

1. Combine information from a variety of media to expand background information.
2. Formulate non-print material & media to express ideas & feelings, & to retell stories.
3. Interpret audiovisual resources to improve language fluency.
4. Read newspapers and magazines to learn about current events.

READING

1. Associate printed word with object or concept it represents and predicts meaning of unknown words through context.
2. Extend reading vocabulary by using appropriate word attack skills.
3. Develop literal, interpretive & critical reading comprehension skills.
4. Self-correct approximations based on semantic and syntactic clues.
5. Expand vicarious experiences by exposure to wide variety of reading materials, including expanded role models.
6. Use beginning reference skills to locate information.
7. Read material orally with fluency, clarity & expression.
8. Demonstrate ability to self-select materials and participate in sustained silent reading.
9. Predict story outcome.

REASONING

1. Identify similarities and differences in ideas & concepts & arrange & categorize them.
2. Demonstrate the process of logical thinking by sequencing, classifying, asking questions, making choices, & expressing opinions as the basis for developing problem solving abilities.
3. Derive logical solutions to simple problems by making appropriate choices & reasonable decisions.
4. Draw reasonable conclusions from information.

SPEAKING/LISTENING

1. Use oral expression experience to demonstrate proficiency of the English language in a variety of situations such as small group discussions & individual performance.
2. Use clear, concise language.
3. Alternate speaking-listening interactions during a conversation and discussions.
4. Listen & respond appropriately to oral language for the following purposes: attentively to gain information; analytically for comprehension; appreciatively for enjoyment; critically for making judgment; marginally at the passive level; & courteously.
5. Develop an understanding of the inappropriateness of name calling, ethnic or racial slurs & demeaning jokes.

WRITING

1. Demonstrate the understanding that oral language can be written by dictating captions, experience charts & stories.
2. Tell & write brief fictional & personal narratives that derive from experience.
3. Recall through writing simple personal data.
4. Participate in daily writing activities.
5. Write paragraphs containing stated main idea & supporting details.
6. Share personal experiences & feelings in writing prose & poetry.
7. Expand writing vocabulary by applying phonetic principles & inventive spelling to bring spoken language to paper.
8. Write legibly in manuscript or cursive.

MATH TOPICS – GRADES K-3

NUMBERS & NUMERATION

1. Read and write whole numbers.
2. Compare the size of whole numbers using place value manipulative materials.
3. Demonstrate the ability to conserve number.
4. Count by ones, twos, fives, and tens.
5. Demonstrate one-to-one correspondence using manipulative materials.
6. Demonstrate the use of ordinal numbers.
7. Give examples, which relate simple fractions to parts of a whole.
8. Order whole numbers from zero to one hundred.

OPERATIONS

1. Illustrate addition and subtraction using manipulative materials.
2. Demonstrate the relationship between addition and substraction using manipulative materials.
3. Recognize and use the commutative and associative properties of addition with manipulative materials. (not necessarily by their formal names and definitions)

MEASUREMENT

1. Name the seasons, months, days of the month, and the days of the week.
2. Tell time to the hour and half-hour.
3. Determine the value of collections of coins to $1.00.
4. Use appropriate vocabulary to describe the relative positions of objects: above, below, behind, in front, etc.
5. Measure length in arbitrary units using manipulative materials.

GEOMETRY

1. Identify and illustrate squares, circles, rectangles, and triangles.
2. Recognize open and closed curves.
3. Recognize parallel and intersecting lines.

COLLECTION AND USE OF DATA

1. Gather, organize, and interpret simple data.
2. Read and construct pictographs and bar graphs.
3. Predict simple outcomes.

PROBLEM SOLVING

1. Create and solve simple word problems that are suggested by groupings of physical materials.
2. Evaluate the reasonableness of answers.
3. Interpret a written problem verbally.
4. Use pictorial representations to solve problems.
5. Estimate answers.
6. Create number stories for oral exploration of numerical problems.

SCIENCE TOPICS – GRADES K-3

PROCESSES

1. OBSERVING – using the senses (seeing, tasting, touching, hearing and smelling) to find out about objects or events in the environment.
2. DESCRIBING AND COMPARING – recognizing and relating ways in which objects or events are alike or different.
3. CLASSIFYING – grouping objects or events according to their observed characteristics.
4. INFERRING – suggesting explanations, reasons or causes for events which have occurred which may not be directly observable.
5. PREDICTING – describing in advance the outcome of an event or process based on observations or data.
6. MEASURING – finding out about an unknown quantity by comparing its mass, areas, length or volume with a known quality.
7. COMMUNICATING – conveying information through the use of oral or written descriptions, pictures, graphs, charts, maps, demonstrations, etc.
8. INTERPRETING DATA – explaining the meaning or the significance of information regarding an object or event.
9. FORMULATING QUESTIONS – thinking, asking and writing questions based on the nature and process of scientific events.
10. EXPERIMENTING – designing and carrying out procedures under controlled conditions in which variables are limited to obtain reliable information about interrelationships between objects and events.
11. HYPOTHESIZING – stating a probable explanation for some occurrence which is subject to testing.

LIFE SCIENCE

1. Explain the basic needs of plants and animals.
2. Classify different plants according to characteristics such as habitat, function, season, etc.
3. Graph the growth of a plant from a seed from data collected daily over a period of time.
4. From a picture of an animal describe how its structure helps it to survive.
5. With three known characteristics of a mystery animal, classify it as a mammal, reptile, amphibian, bird, insect, or fish.
6. Illustrate four chronological stages of growth of an animal.
7. Describe the breathing process.
8. Illustrate the circulation of blood to and from the heart.
9. Dramatize the function of the brain in the nervous system.
10. Trace the path of a food particle through the digestive system.
11. Suggest systematic ways of finding a solution to a given science problem.

PHYSICAL SCIENCE

1. Demonstrate through an experiment how matter can change from one state to another (i.e. liquid becomes solid, liquid becomes gas by heating or cooling.).

2. Compare and contrast the properties of liquids, solids & gasses.
3. Demonstrate the operation of a pump & relate it to the workings of a heart.
4. Use the concepts of color, reflection, shadow & intensity to explain light.
5. Use a source of heat to show expansion and contraction of metals.
6. Through an experiment, explain variations in sound using concepts of pitch and vibration.
7. Compose and/or illustrate electrical safety rules.
8. Demonstrate properties of magnetism.
9. Observe the physical properties of several objects & predict which will be magnetic.

EARTH & SPACE SCIENCE

1. Show how minerals are formed using a solution that evaporates leaving crystals.
2. Identify the major components of the air we breathe.
3. Draw a diagram of our solar system.
4. Given information about an imaginary planet (temperature, length or year, composition), locate it in the solar system.
5. Calculate and compare your age on earth to that on another planet after one orbit around the sun.
6. Using a light source, describe how the sun and stars produce heat and light.
7. Design a community on the moon, and contrast it to one on earth.
8. Trace water through its natural cycle.
9. Explain with models the Earth's daily and seasonal cycles.
10. Collect & record weather observations & make predictions based on this data.
11. Research and report on a destructive natural event and its effect on the weather and the environment (a hurricane, tornado, volcano, flood, etc.)
12. Classify rocks by how they were formed, by hardness, or by texture.
13. Identify several common minerals found in Vermont
14. Illustrate the formation of a fossil.

ENVIRONMENTAL SCIENCE

1. Recognize the effects of natural forces in changing the shape of the land.
2. Make an oral report to the class on steps taken at home to conserve air, water, light, heat an/or soil.
3. Write a class article for the local newspaper listing spots in the community with noticeable noise, air, water, or land pollution adding suggestions for improvement.
4. Demonstrate the effects of one of the following changes using before and after models: erosion, building construction, forest fire, or dumping.
5. Describe a simple ecosystem that demonstrates the relationship of plants and animals to their environment (i.e. diorama, mural).
6. Compare the plant life of a desert, an ocean, and a Vermont field.
7. "Construct" a habitat for a specific animal taking into consideration the need for shelter, food, protection and seasonal change.
8. Predict what would happen to an animal if one of the following occurred: a) winter never came, b) water supply was polluted, c) a new highway was built through the forest.
9. Identify some good and bad effects of technology on your daily life.
10. Create a technological invention that would benefit mankind.

SOCIAL STUDIES TOPICS – GRADES K-3

CONTENT

Self-awareness
Family
School
Neighborhood
Community
Occupations
Rules & responsibilities
Traditions & customs
Transportation & communication
Interdependence of people & cultures
Time & sequence
Map skills

GEOGRAPHY

1. State home address & telephone number.
2. Construct a simple floor plan
3. Describe route taken from home to school.
4. Identify & explain landmarks & other geographical features in the community.
5. Identify environmental features in the community.
6. Explain how climate & surroundings affect the way people dress & live.
7. Use & draw simple charts, diagrams, graphs, & maps.
8. Apply terms involved with direction, location, and distance.
9. Interpret simple maps of classroom, school, & community.
10. Recognize a glove as a representation of the Earth, & identify simple features on it.
11. Recognize simple map symbols.

HISTORY

1. Investigate family history.
2. Explore local history & historical sites.
3. Recognize variety of nationalities in community.
4. Identify history of local occupations including the contributions of women & minorities.
5. Identify events & people from the past, including women & minorities, to help understand our traditions.
6. Explain basis of important holidays.
7. Use the calendar to identify & locate the days, months of the year, seasonal celebrations, & holidays.
8. Identify days of the week, months, seasons, year; use related time concepts.
9. Gather & interpret information from simple pictures, charts, & graphs.
10. Use the media to gather information about current events.

ECONOMICS

1. Describe how people depend on each other for goods and services.
2. Recognize that money & other forms of economic exchange may be used to obtain goods & services that people need and want.
3. Identify natural resources of the community & recognize their importance.
4. Identify different means of transportation.
5. Recognize interdependence of area communities.
6. Describe the kinds of work people do & the tools they use.
7. Identify people's needs & wants.
8. Recognize that people must make choices about how to spend money.

LAW & GOVERNMENT

1. Assume classroom responsibilities.
2. Identify the need for rules at home & in school.
3. Help make classroom rules.
4. Tell how and why rules protect rights & property.
5. Participate actively in the decision-making process by identifying problems & suggesting possible solutions.
6. Identify the adults in school by the jobs they perform.
7. Identify local, state, & national symbols & patriotic songs; and recite the pledge of allegiance.
8. Role play process of elections.
9. Recognize that citizens can influence government decisions.
10. Demonstrate cooperation when working in a group.
11. Recognize basic freedoms & rights provided by the American form of government.

SOCIOLOGY

1. Recognize self as a unique, individual.
2. Describe personal feelings.
3. Identify different family structures.
4. Identify the physical & social needs of a family.
5. Identify tasks that people must do in the family & at school.
6. Identify examples of the basic physical needs of people: food, clothing, & shelter.
7. Recite personal biographical data.
8. Demonstrate appropriate behavior toward others, & exhibit good social skills.
9. Participate in group activities.

ANTHROPOLOGY

1. Identify the different ways people communicate.
2. Compare & contrast family lifestyles of different cultures.
3. Examine similarities & make simple generalizations about communities being studied.
4. Compare & contrast surrounding communities.
5. Recognize interdependence of people and groups.
6. Recognize changes in environment & describe ways people adapt to change.
7. Compare customs & habits of different ethnic groups in the United States & groups in other parts of the world.

PSYCHOLOGY

1. Discover that rules, beliefs, customs, and values influence behavior.
2. Recognize that an individual has social roles in the family, school, and community which affects his/her behavior.

LANGUAGE ARTS TOPICS – GRADES 4-6

SPELLING

1. Extend alphabetizing skill.
2. Abbreviate days of the week/months/titles/streets/states.
3. Obtain information by using the dictionary for definitions and pronunciation.
4. Apply rules for suffixes and prefixes.
5. Use context clues to spell homophones.
6. Locate words in the dictionary through use of guide words.

GRAMMAR

1. Form complex sentences, using the most common subordinating conjunctions.
2. Use coordinating conjunctions to connect equal elements.
3. Use pronouns effectively, including to point out use of generic male pronoun & its effect on language.
4. Use appropriate word order.
5. Use regular & irregular verb forms correctly.
6. Use proper subject-verb agreement.
7. Determine function of words & phrases by their position in a sentence.
8. Use verb forms to express time.
9. Form plurals of nouns.
10. Distinguish contemporary & historical influences on language.
11. Apply knowledge of roots & affixes to understand work meaning & functions.

LITERATURE

1. Identify & use figurative language which an author uses to enhance the quality of literature.
2. Describe & demonstrate that literature has a variety of forms & purposes.
3. Discuss language which creates & stimulates positive & negative mood.
4. Recognize & use various forms of poetic style.
5. Develop criteria for critical evaluation of literature.
6. Distinguish between fact & fantasy, fiction & non-fiction, biography & autobiography.
7. Identify language which an author uses which promotes stereotypes & bias.

MEDIA

1. Explain the organization of library-media center.
2. Locate (in the library media center) a variety of print & non-print material on an assigned topic.
3. Operate & use a variety of audiovisual equipment.
4. Develop simple criteria for evaluating print & non-print media.
5. Use appropriate sections of newspapers/magazines to locate information.
6. Use a multi media approach to express himself/herself logically & creatively.

READING

1. Develop vocabulary appropriate for instructional content & activities & use context clues to approximate meanings of new words.
2. Relate past experiences to reading material.
3. Distinguish that print is written language.
4. Demonstrate ability to self correct based on readjustment of predictions.
5. Use a variety of reference sources to locate information, solve problems, & answer questions.
6. Distinguish that personal values & points of view influence what is said, heard, or read.
7. Use leisure time for self-selected sustained reading.
8. Identify stated and implied main ideas & supportive details in related paragraphs.
9. Distinguish between fact and opinion.

REASONING

1. State a summary of conclusion based on data using charts, graphs, tables, maps, or list of facts.
2. Predict outcome based on relevant information.
3. Use available information to apply understandings to solve new problems in new situations.

SPEAKING/LISTENING

1. Speak before a group to express or defend an opinion or a point of view, present information, tell a story, present an oral interpretation of literature, read orally, & take part in a choral reading.
2. Use clear, concise language which is organized & incorporates words from vocabulary study, spelling, reading, & listening.
3. Effectively participate in a discussion by alternating the role of speaker & listener.
4. Recognize when another does not understand the message.
5. Listen & respond attentively to gain information.
6. Listen & respond analytically with comprehension.
7. Listen & respond appreciatively for enjoyment.
8. Listen & respond critically to make judgments, solve problems, & make predictions.
9. Listen & respond courteously.
10. Adjust listening & responding strategies according to purpose.

WRITING

1. Write a paragraph in which all of the sentences are related to one topic.
2. Proofread written works for spelling & mechanical errors.
3. Write clear, understandable directions & explanations.
4. Vary written communications according to purpose & audience using vivid & specific written language, including friendly letter.
5. Select & narrow a topic to be used in a written assignment.
6. Organize information in outline form.
7. Write for purpose of argumentation, narrative exposition, & persuasion.
8. Use connecting words & phrases to establish relationship between or among paragraphs.

9. Follow suggestions made during peer and teacher conferences to revise & edit written work.
10. Increase spelling skills & writing vocabulary through the use of word attack skills, dictionary sills & memory.
11. Use a word processor in writing & editing.

MATH TOPICS – GRADES 4-6

NUMBERS AND NUMERATION

1. Write counting numbers in expanded notation.
2. Distinguish between even and odd cardinal numbers.
3. Write the number names in English.
4. Distinguish between prime and composite numbers.
5. Read & write Hindu-Arabic numbers from thousandths to billions.
6. Demonstrate the existence of integers through common examples.
7. Order simple fractions using manipulative materials.
8. Demonstrate equivalent fractions using manipulative materials.
9. Compare and contrast the Hindu-Arabic number system with other number systems.

OPERATIONS

1. State a word problem for a number sentence.
2. Recite the addition facts for whole numbers zero to ten.
3. Recite the multiplication facts for whole numbers zero to ten.
4. Add, subtract, multiply, and divide whole numbers.
5. Explain the inverse relationship between addition and subtraction, and between multiplication and division.
6. Add and subtract fractions using manipulative materials.
7. Estimate sums, differences, products, & quotients of whole numbers.
8. Use a calculator and/or a computer when appropriate.
9. Evaluate expressions using the correct order of operations.

MEASUREMENT

1. Make linear comparisons with inches, feet, yards, centimeters and meters.
2. Tell time with a clock.
3. Measure lengths with metric and English rulers.
4. Read Celsius and Fahrenheit thermometers.
5. Recognize that error is inherent in measurement.
6. Find areas of simple two-dimensional shapes and volumes of simple three dimensional shapes using models or diagrams.
7. Measure angles using a protractor.
8. Compare the origins of the metric and English systems of measurement.
9. Write amounts of money to $999.99 using symbols.
10. Make change for simulated purchases.

GEOMETRY

1. Describe the similarities and differences of trapezoids, parallelograms, rectangles, and squares.
2. Identify parallel and perpendicular lines using intuitive concepts.
3. Determine the congruence of two polygons by superposition and measurement.

4. Solve problems involving area and perimeter of squares, rectangles and triangles requiring whole number operations.
5. Classify angles by their measure.
6. Classify triangles and quadrilaterals according to their special properties.
7. Find & approximation of the value of pi using manipulative materials.
8. Identify the distinguishing properties of segments, rays, lines, angles, polygons, circles, and spheres.

COLLECTION AND USE OF DATA

1. Gather, organize, and interpret data.
2. Read, interpret, and construct bar and line graphs.
3. Construct a frequency table from simple data.
4. Propose and find answers to questions, which require the gathering, organization, and interpretation of data.
5. Use calculators and computers to process data when appropriate.
6. Use mean, median, and mode as numbers that help describe a collection of data.
7. Predict the probability that an event will occur.

PROBLEM SOLVING

1. Use the four step heuristic approach to solve problems:
   a. Identify the problem, including what is known, what can be found, and what is needed.
   b. Plan a strategy.
   c. Solve.
   d. Check for reasonableness of results, units, degree of accuracy.
2. Apply various strategies in the problem solving process.
3. Estimate answers.
4. Use calculators and computers when appropriate in problem solving process.
5. Apply problem-solving skills to life studies.

SCIENCE TOPICS – GRADES 4-6

PROCESSES

1. OBSERVING – using the senses (seeing, tasting, touching, hearing and smelling) to find out about objects or events in the environment.
2. DESCRIBING AND COMPARING – recognizing and relating ways in which objects or events are alike or different.
3. CLASSIFYING – grouping objects or events according to their observed characteristics.
4. INFERRING – suggesting explanations, reasons or causes for events which have occurred which may not be directly observable.
5. PREDICTING – describing in advance the outcome of an event or process based on observations or data.
6. MEASURING – finding out about an unknown quantity by comparing its mass, area, length or volume with a known quantity.
7. COMMUNCATING – conveying information through the use of oral or written descriptions, pictures, graphs, charts, maps, demonstrations, etc.
8. INTERPRETING DATA – explaining the meaning or the significance of information regarding an object or event.
9. FORMULATING QUESTIONS – thinking, asking and writing questions based on the nature and process of scientific events.
10. EXPERIMENTING – designing and carrying out procedures under controlled conditions in which variables are limited to obtain reliable information about interrelationships between objects and events.
11. HYPOTHESIZING – stating a probable explanation for some occurrence which is subject to testing.

LIFE SCIENCE

1. Identify & describe the basic differences between plant & animal cells.
2. Describe cell division.
3. Describe the functions of genes.
4. Explain how materials get into and/or out of cells.
5. Recognize several one-called animals and plants.
6. Demonstrate the function of chlorophyll in food production.
7. Differentiate between asexual and sexual reproduction.
8. Differentiate between reproduction by spores, cones and seeds.
9. Identify flower parts by their function.
10. Describe the roles of various agents of pollination.
11. Observe and report the chronological development of several plant and animal organisms.
12. Design experiments which demonstrate the function of plant parts.
13. Identify causes which explain the extinction of certain plants and animals.
14. Hypothesize reasons for changes in plants and animals over time.
15. Predict how plants or animals may look in the future.
16. Recognize evidence of past life.
17. Contrast and compare vertebrates and invertebrates including their life systems.
18. Trace the progressive development of life systems from protozoan to vertebrates.
19. Identify and describe the major parts and functions of human body systems.
20. Contrast the processes of photosynthesis and respiration.

PHYSICAL SCIENCE

1. Observe & describe an energy change from one form to another.
2. Describe inter-relationships in a energy cycle.
3. Measure energy change data and make inferences from the data.
4. Manipulate materials to observe energy phenomenon.
5. Recognize and classify different states of matter.
6. Construct simple molecular models.
7. Generalize the difference between physical & chemical change & give examples.
8. Demonstrate the ability to use standard units of measure and measurement devices.
9. Collect and graphically record data from physical events in several different ways.
10. Analyze measured data to formulate predictions and generalizations.
11. Identify and demonstrate characteristics of simple machines.
12. Distinguish between chemical compounds, mixtures and/or solutions.
13. Construct simple electrical circuits.
14. Demonstrate the relationship between magnetism and electricity.
15. Contrast the characteristics of several examples of kinetic and potential energy.

EARTH & SPACE SCIENCE

1. Cite evidence that gasses, solids and liquids compose the atmosphere.
2. Describe the layers of the atmosphere.
3. Construct rudimentary weather instruments.
4. Measure factors that influence weather.
5. Translate weather data into forecasts.
6. Compare and contrast weather and climate.
7. Demonstrate the movements of the solar system.
8. Identify and describe the layering of the earth.
9. Recognize simple geologic structures.
10. Differentiate between rocks and minerals.
11. Identify and classify rocks and minerals.
12. Identify changes that produced fossils.
13. Identify methods for dating fossils.
14. Construct models demonstrating principles of flight.
15. Contrast mass and gravity.
16. Evaluate the impact of space program technology on our future.
17. Compare operation principles of jets, rocks, and satellites.
18. Describe the space environment.

ENVIRONMENTAL SCIENCE

1. Construct and identify model food webs
2. Describe the interaction of several ecosystems.
3. Report and hypothesize several of mankind’s positive and negative effects on the environment.
4. Design corrective methods to counteract abuse of the environment.
5. Demonstrate the “greenhouse” effect.
6. Identify the causes and effects of air, land and water pollution.
7. Relate the use of energy sources to future societal issues & careers.
8. Discuss the importance of energy conservation in homes, schools, and businesses.

SOCIAL STUDIES TOPICS – GRADES 4-6

CONTENT

Regions & interdependence
Physical features of Vermont, the United States, a world region, or another country
People's influences on environment
Environmental influences on people
Group interactions: family, community, state, nation, & world
Human activity, change & development
Continuity in change & development
Influence of events on people
Influence of people on events
Similarity & differences among people: values, beliefs, rules, customs, behaviors
People's responsibilities to people, environment, & the future
Human conflict & conflict resolution
People supply basic needs in a variety of ways
Natural resources effects on people's needs
Interdependency of economic systems among regions
People's need for order
Variety of structures which provide order
Universal characteristics of humanity

GEOGRAPHY

1. Construct maps, graphs, & charts to demonstrate physical & cultural patterns using appropriate keys.
2. Interpret maps, graphs, & charts.
3. Identify & locate geographical features of Vermont, United States, & other world regions. Describe differences & similarities.
4. Examine environmental influences on people's settlement patterns, lifestyle, and economic options.
5. Analyze patterns of population distribution in Vermont, United States, and another world region.
6. Distinguish between cultural & physical regions using local, national, and world examples.
7. Describe climatic regions; compare & contrast two regions.
8. Explain how climate affects people's needs for food, clothing, shelter, transportation, and communication.
9. Describe use of natural resources in Vermont, United States, & another world region.

HISTORY

1. Identify patterns of change & development caused by human activity in Vermont, the United States and another world region or country.
2. Appraise settlement patterns & colonization in Vermont, the United States, and another world region or country.
3. Analyze conflict/conflict resolution between groups of countries for Vermont, the United

States and another world region or country.
4. Explain & appraise government formation in Vermont, the United States and another country.
5. Compare & contrast slavery & its abolition in Vermont, the U.S. and another country.
6. Recognize that individual rights have evolved as a result of human political activity and that this evolution has varied among nations.
7. Analyze expansion, modernization, & industrialization, including the contributions of women & minorities in Vermont, the United States, & another world region or country.
8. Recognize the contributions culture & traditions of Native Americans in Vermont & the United States.
9. Analyze immigrant influence on change & development in Vermont, the United States, & another country.
10. Identify American influence on other countries.
11. Identify foreign influence on the United States.
12. Construct a timeline which illustrates change & development caused by human activity in Vermont, the U.S., another country or world region.
13. Examine contemporary issues & events & project possible consequences.

ECONOMICS

1. Examine alternative ways people meet basic needs for food, clothing, & shelter within America, another region of the world, or another country.
2. Compare & contrast alternative ways people meet basic needs among varying cultures.
3. Appraise people's needs & wants in terms of natural & manufactured resources, supply, demand, consumption, scarcity, conservation, and exploitation.
4. Illustrate Vermont's economic interactions with other states & America's interactions with other countries.
5. Identify America's, Vermont's & another country's natural resources and explain their importance and uses.
6. Hypothesize about the needs and wants of future Vermonters and how they might meet those needs.

LAW & GOVERNMENT

1. Analyze people's needs for rules & laws in family, state, national, and international relationships.
2. Explain the functions of the functions of the 3 branches of government
3. Recognize the individual's civic responsibilities.
4. Compare & contrast America's form of government with the government of another country.
5. Recognize individual rights (liberty, equality, justice).
6. Describe the content of the Declaration of Independence and Bill or Rights.
7. Identify components of Vermont local & state government.
8. Identify representative democracy, parliamentary democracy, communism, dictatorship, and monarchy.
9. Create a classroom law (bill), debate it, vote on it, establish procedures to enforce it, & appraise its effectiveness.

SOCIOLOGY

1. Describe roles individuals play in groups such as family, peers and co-workers.
2. Demonstrate group influences on individual behavior.
3. City need for & examples of social control.
4. Identify basic social institutions & their function in society.
5. Describe elements of socialization.

ANTHROPOLOGY

1. Compare & contrast beliefs, values, & customs of American with selected world culture.
2. Illustrate how customs, values & beliefs influence behavior.
3. Examine different material & non-material cultures.
4. Describe how people transmit their beliefs, values, & traditions.
5. Identify stages of human development.
6. Describe people's interdependency.
7. Describe people's relationship with environment; how people affect the environment; & how the environment affects people.
8. Design a futuristic culture.
9. Identify differences in food, clothing, shelter & traditions of different ethnic groups in Vermont, the United States, and in another country.
10. Describe the culture of Vermonters prior to European intervention.

PSYCHOLOGY

1. Recognize individual differences & similarities.
2. Identify human emotions.
3. Compare & contrast innate and learned behavior.
4. Recognize the rules, beliefs, customs & values influence behavior.
5. Categorize people's emotional needs.
6. Create a perfect day. Describe what you would do with your day, and how you would feel about it.
7. Define discrimination, prejudice, bias and stereotyping.

LANGUAGE ARTS TOPICS – GRADES 7-8

SPELLING

1. Enlarge speaking, reading & writing vocabulary through the use of spellings skills.

GRAMMAR

2. Articulate the function of words within sentences.
3. Name basic grammatical terminology.
4. Derive appropriate pronouns & antecedents.
5. Discuss the dynamic nature of language by identifying changes in pronunciation, meaning & word usage.

LITERATURE

1. Explain that literature reflects the purpose, values & ideas of the author.
2. Expand range of interest through reading for pleasure and/or information.
3. Compare themes in adolescent literature with personal experience.
4. Outline the basic methods the author uses to create characters.
5. Demonstrate an appreciation for classics & contemporary literature appropriate for the adolescent reader.
6. Define figurative language, idiomatic expression, colloquial terms, allusions, stereotyping & bias.

MEDIA

1. Use media to expand cultural development, knowledge base & vicarious experiences.
2. Process information from a variety of media & use a variety of media to make reports.
3. Analyze a variety of media to learn about current events.
4. Locate & read international, national, state & local news, sports & editorial sections of the newspaper.
5. Establish criteria for comparing & evaluating the effectiveness of media & media presentations.
6. Operate & use audiovisual equipment.

READING

1. Adjust reading rate according to purpose & difficulty of material.
2. Compare concepts & generalizations based on information or ideas encountered in a variety of reading materials.
3. Self-select a wide variety of reading materials.
4. Expand reading vocabulary through use of context clues to acquire word meaning in reading passages of increasing difficulty.
5. Use library & reference skills to locate information.
6. Participate in oral reading and/or performance of dramatic materials.
7. Discern author's purpose.
8. Preview textbook reading assignments using editorial aids.
9. Use study skill techniques for effective reading.

REASONING

1. Report data related to problem.
2. Synthesize information from multiple sources.
3. Propose causes of or solutions to a problem.
4. Solve problems when presented with information by identifying components & their relationship & arrangement.
5. Compare ideas obtained from various sources.
6. Detect & react appropriately to propaganda & biases.

SPEAKING/LISTENING

1. Participate in dramatic presentations.
2. Paraphrase orally from written & oral communications.
3. Listen to & paraphrase information orally to put the message in own words.
4. Use clear, concise language which is organized according to purpose, audience, and situation.
5. Exhibit confidence as a speaker through effective use of language, body, & voice.

WRITING

1. Express him/her self in writing using forms of his/her own choice.
2. Record regularly his/her experiences, thoughts, & feelings.
3. Write narrative fiction.
4. Write coherent paragraphs using effective methods of arranging details.
5. Write business letters for various purposes.
6. Complete forms & applications.
7. Write paraphrased information & summarize materials in writing.
8. Exhibit effective questioning & analytic sentences during a writing conference.

MATH TOPICS – GRADES 7-8

NUMBERS AND NUMERATION

1. Describe the characteristics of integers, order them, and plot them on the number line.
2. Order rational and irrational numbers on a number line.
3. Round any number in the range of billions to billionths to a given place value.
4. Explain the need for and the use of estimation.
5. Express any number in the range of billions to billionths in expanded and scientific notation.
6. List the prime factors of any three-digit number and express them using exponents.
7. Describe and find the greatest common factor and least common multiple of a set of numbers.
8. Express percent in several ways.
9. Express equivalent relationships between fractions, decimals, and percents.

OPERATIONS

1. Add, subtract, multiply, and divide rational numbers arranged either horizontally or vertically.
2. Find squares and square roots.
3. Use calculators and computers when appropriate.
4. Estimate sums, differences, products, and quotients.
5. Apply formulas such as D=rt, A=lw, V=lwh, A=~r2 etc.
6. Use appropriate mathematical vocabulary.
7. Solve simple linear equations and open sentences.
8. Use percents in computation by converting to equivalent fractions or decimals.
9. Find and use greatest common factors and least common multiples.
10. Evaluate expressions using the correct order of operations.
11. Find fractional parts of whole numbers.

MEASUREMENT

1. Use estimated values to check measurements of lengths, area, volume, mass, and temperature.
2. Determine the precision of calculations involving measured quantities by the least precise measurement.
3. Measure volume using containers graduated in metric and English units.
4. Measure mass (weight) using devices graduated in metric and English units.
5. Recognize that error is inherent in measurement and estimate variations caused by error.

GEOMETRY

1. Find surface area and volume of prisms, pyramids, spheres, cylinders, and cones.
2. Measure and categorize angles.
3. Explain the meaning of congruence and similarity by visual comparison.
4. Determine congruent or similar figures by measurements of the least number of corresponding parts.
5. Recognize different types of symmetry.

6. State and apply the Pythagorean Theorem.
7. Recognize and use the vocabulary and symbols of geometry.
8. Find and approximation of the value of pi and use it appropriately.
9. Use LOGO, the Geometric Supposer, and other appropriate computer software.
10. Perform the standard Euclidean constructions using compass and straight-edge.
11. Determine when lines are parallel by the measure of the appropriate angles made by a transversal.
12. Use the Pythagorean Theorem when appropriate to calculate an unknown length.

COLLECTION AND USE OF DATA

1. Find the value of and explain the meaning of average, mean, median, mode, and range of a collection of data.
2. Analyze and solve simple one or two event probability problems, including the collection of data.
3. Graph ordered pairs in all four quadrants.
4. Graph linear functions.
5. Read, interpret, & construct pictographs, bar, line, & circle graphs.
6. Calculate the number of finite orderings for a set of different numbers.
7. Determine the probability of events using sample spaces.
8. Use a computer to process the results of an experiment or survey.
9. Explain when to use a sample versus a census method of data collection.

PROBLEM SOLVING

1. Make a model or picture.
2. Obtain relevant data from the text, other written sources, or from experimental results.
3. Perform computations, making appropriate use of calculators & computers, including applicable software.
4. Generate and check solution candidates.
5. Organize data in lists, tables, or graphs.
6. Make inferences and generalizations.
7. Simplify data.
8. Write and use equations and formulas.
9. Explain and use the concept of iteration to process an algorithm.
10. Use logical sequencing and operators.
11. Solve problems with no numbers.
12. Solve problems that contain unneeded information.
13. Explore problems with insufficient information.
14. Explore problems with multiple solutions.
15. Solve problems involving ration and proportion.
16. Solve problems involving area & perimeter of squares, rectangles and triangles.
17. Solve problems involving probability using manipulative materials and computers.
18. Work with others in groups to solve problems.

SCIENCE TOPICS – GRADES 7-8

PROCESSES

1. OBSERVING - using the senses (seeing, tasting, touching, hearing and smelling) to find out about objects of events in the environment.
2. DESCRIBING AND COMPARING - recognizing and relating ways in which objects or events are alike or different.
3. CLASSIFYING - grouping objects or events according to their observed characteristics.
4. INFERRING - suggesting explanations, reasons, or causes for events which have occurred which may not be directly observable.
5. PREDICTING - describing in advance the outcome of an event or process based on observations or data.
6. MEASURING - finding out about an unknown quantity by comparing the mass, area, length or volume with a known quantity.
7. COMMUNICATING - conveying information through the use of oral or written descriptions, pictures. Graphs, charts, maps, demonstrations, etc.
8. INTERPRETING DATA - explaining the meaning or the significance of information regarding an object or event.
9. FORMULATING QUESTIONS - thinking, asking and writing questions based on the nature and process of scientific events.
10. EXPERIMENTING - describing and carrying out procedures under controlled conditions in which variables are limited to obtain reliable information about interrelationships between objects and events.
11. HYPOTHESIZING - stating a probable explanation for some occurrence which is subject to testing.

LIFE SCIENCE

1. Identify basic cell parts by their function.
2. Locate cells and basic cell parts with a microscope and record the findings.
3. Compare and contrast plant and animal cells.
4. Categorize cells by appearance and the role they play in an organism.
5. Research information on cells and relate that information to their role in multi-cellular organisms.
6. Identify and diagram the organs of an organism and describe their functions.
7. Design experiments that provide measurable data to show relationships between systems within an organism.
8. Relate organs to systems.
9. Compare and contrast the organs and systems of several plants and animals.
10. Categorize organisms by appearance, habitat and behavior.
11. Design and use classification keys.
12. Recognize and evaluate the relationship of foods to body function.
13. Design diets which satisfy individual nutritional needs.
14. Predict the effects of foreign substances on body function.
15. Distinguish diseases by changes in body function.
16. Identify natural body defense systems.
17. Predict the consequences of various treatments for disease.

PHYSICAL SCIENCE

1. Demonstrate the safe use and care of laboratory equipment and supplies.
2. Design and carry to experiments that demonstrate physical & chemical change.
3. Chart or graph measurable date showing the properties of matter.
4. Distinguish between elements, compounds and mixtures.
5. Chart or graph measurable date when a force is applied to do work.
6. Categorize energy forms (electrical, mechanical, chemical, etc.) as kinetic or potential.
7. Design & carry out experiments to demonstrate energy change.
8. Apply the law of conservation of matter to chemical
9. Construct and explain models which illustrate molecular structure.
10. Infer characteristics and/or properties of elements of a periodic table.
11. Demonstrate fundamental properties of sound and light.
12. Demonstrate fundament applications of electricity and magnetism.
13. Interpret molecular formulas.
14. Differentiate between acids, bases and salts.

EARTH & SPACE SCIENCE

1. Describe the relationship between the Earth and moon
2. Illustrate the organization and interaction of bodies in the solar system.
3. Research information on celestial bodies of the universe and make inferences about their nature.
4. Describe the layers and force of the atmosphere.
5. Collect, chart or graph weather data and predict future weather.
6. Design experiments that show the effect weather has upon the Earth.
7. Compare and contrast severe weather phenomena.
8. Draw conclusions about climate from weather & physical geography data.
9. Collect and record data on the physical properties of rocks & minerals.
10. Identify rocks & minerals using a classification key.
11. Describe the composition of the Earth.
12. Identify internal & external forces that change the structure of the Earth.
13. Chart, graph or map results of geologic activities.
14. Predict the result of the action of geologic force on an area of the Earth.
15. Interpret the relationships between rocks & minerals & the Earth's geologic activities.
16. Research information to predict the result of man's interaction with geological activity.
17. Formulate basic ideas about the origin of the Earth using research information.
18. Sequence a group of geologic events.
19. Construct timelines to illustrate relative lengths of geologic events in chronological order.
20. Infer the age of fossilized material and rocks using date from radioactive dating.
21. Interpret data to draw conclusions about geologic periods.

ENVIRONMENTAL SCIENCE

1. Identify and describe the living and non-living parts of an ecosystem.
2. Design and carry out experiments which illustrate the relationship between living and non-living parts of the ecosystem.

ANTHROPOLOGY

1. Describe a non-extant culture based on examination of its artifacts.
2. Describe a culture based on its physical environment.
3. Analyze two or more eras for common cultural elements.
4. Using several sources, describe the ethos of a particular group of people.

PSYCHOLOGY

1. Role play a conflict situation and negotiate a resolution.
2. Justify and empathize with the grievances of a minority group.

SOCIAL STUDIES TOPICS – GRADES 7-8

CONTENT

Region as an area of cultural/physical homogeneity
The Earth's limited resources
People/earth relationships
History as a living force, a series of changing events, peoples & trends
History as a series of cause and effect relationships
Continuity in human events
Conflict throughout human experience
Historical perspective
Historical evidence
Economic systems: scarcity, supply & demand, & natural resources
Economic interdependence among the world cultures
Cultures as a reflection of physical environment and social experiences
Discovery, exploration, and settlement
Conflict and conflict resolution: forms, causes, and methods
Governing a nation: forms of government, citizenship & political leadership
Patterns of economic development: resources, government's role, labor, technology and markets
Frontiers and mobility: migration patterns and social change
Minority studies
Future perspectives

GEOGRAPHY

1. Compare and contrast any two regions of the world
2. Identify factors in Earth's past and current formation (weathering, continental drift, plate tectonic)
3. Categorize renewable and non-renewable resources
4. Distinguish between cultural features and natural features
5. Demonstrate the relationship between Earth's resources and human use
6. Weigh people's impact on Earth's ecology
7. Identify and local various land forms and bodies of water
8. Differentiate, read, interpret, and construct maps
9. Define and illustrate the Earth in space
10. Compare and contrast earlier maps & globes with those of present day
11. Observe and report data based on special purpose maps
12. Locate the frontiers of the United States during different periods

HISTORY

1. Construct a timeline of important events in the history of any culture
2. Recognize causes for an historical event (effect)
3. Predict future effects of current events
4. Show elements of human experience which have remained constant in a culture
5. Analyze the arguments in a conflict/dilemma
6. Propose solutions to a conflict/dilemma

7. Consider and classify various forms of evidence in the study of a culture's past
8. Identify the elements that bring about exploration
9. State each argument in a conflict and suggest methods of resolution
10. Use primary and secondary sources of evidence
11. Judge the reliability of various sources of evidence
12. Distinguish statements of fact and opinion

ECONOMICS

1. Describe the types of economic systems
2. Hypothesize about the consequence of changes in supply and/or demand
3. Classify the work people do with the goods and services that are produced
4. Illustrate global economic interdependence by describing how a product is made with resources from various countries
5. Appraise the result technological change
6. Describe how economic factors may be a cause for conflict
7. Construct and read charts of economic growth
8. Predict future trends in the economy of a selected country

LAW & GOVERNMENT

1. Debate the pros and cons of the various systems of government
2. Identify the individual or group which exercises the most power in various political systems
3. Justify why a set of rules or laws has been developed in a culture
4. Design a set of rules or laws for a hypothetical society
5. Determine a society's values based on its activities
6. Cite examples of what is good citizenship in a society
7. Illustrate the influences of propaganda on citizen action

SOCIOLOGY

1. State the various groups to which an individual may belong
2. Classify, without stereotyping, the roles, responsibilities and function of the individual members of a specific group
3. List the universal institutions of all cultures
4. Create a model of social classes that reflect the values of a particular group
5. Describe how different cultures have influenced one another
6. Appraise the difficulties of adaptation and assimilation of cultures
7. Predict sociological pattern changes in the future

LANGUAGE ARTS TOPICS – GRADES 9-12

SPELLING

1. Enlarge speaking, reading & writing vocabulary through the use of correct spelling skills.

GRAMMAR

1. Edit punctuation to clarify meaning.
2. Verbalize common coordinating conjunctive adverbs appropriately.
3. Use modifiers effectively.
4. Articulate the changing nature of language.
5. Incorporate knowledge of the nature of the English language in reading, and in writing oral & media presentations.
6. Analyze the historical development of the English language including development of male, female and various ethnic language patterns.
7. Utilize the mechanics of the language for clear communication.

LITERATURE

1. List characteristics that distinguish literary types.
2. Summarize themes of literary works.
3. Distinguish between literal & figurative language.
4. Derive the history & culture of a people through literature.
5. Read a wide variety of literature, including themes by and about minorities and women.
6. Relate the relationship between style & meaning in literature.
7. Appraise elements of persuasion, propaganda & stereotyping techniques.

MEDIA

1. Discuss the organization of information in the library/media center.
2. Use library/media center for research using a variety of media to gain information.
3. Evaluate a variety of media for creative productions.
4. Select appropriate media for reports & creative productions.
5. Develop criteria to evaluate media presentations.
6. Develop knowledge of the practical use of computers a word processor and an information processor.
7. Evaluate a variety of media for equity.

READING

1. Differentiate between connotative & denotative meanings of words in context.
2. Make inferences from printed information.
3. Identify author's point of view & explain its function & impact.
4. Synthesize information from multiple sources.
5. Use library resources to prepare research projects.
6. Use research skills to gather & evaluate information useful in solving problems & making decisions.
7. Read consumer information & indicates appropriate action.
8. Read orally & silently for comprehension.

REASONING

1. Explain functions of persuasion in society.
2. Apply principles of abstract & analytical reasoning when evaluating information.
3. Use information & apply understandings to solve new problems in new situations when new directions or methods of solution are specified.
4. Generate criteria for making value judgments.
5. Use research sills to gather and evaluate information useful in solving problems in making decisions.
6. Use bibliographical data to discriminate between valid & invalid sources of information.
7. Detect & react appropriately to propaganda and biases.

SPEAKING/LISTENING

1. Use evidence to support contentions when presenting a point of view.
2. Demonstrate a sense of responsibility for participating in discussions & conversations.
3. Display a sense of responsibility for making appropriate contributions to discussions & conversations.
4. Use diction, vocabulary & language appropriate for the type of presentation & the nature of the audience when speaking publicly.
5. Demonstrate competence as an interviewer & interviewee.

WRITING

1. Write essays with a clear thesis statement and cohesion among paragraphs.
2. Experiment with writing various literary forms.
3. Use specific words in place of general words.
4. Write for a variety of audiences.
5. Use varied sentence structure to enhances and clarify meaning.
6. Write a multi-paragraph letter applying for job and/or seeking admittance to a college.
7. Write a documented informational paper.
8. Write effective sentences, paragraphs, & papers that reveal style appropriate for the writer's purpose & audience.
9. Write a persuasive composition.
10. Write a critical essay on a book, play, movie, & TV program.

MATH TOPICS – GRADES 9-12

NUMBERS AND NUMERATION

1. Identify axioms for the real number system.
2. Recognize the need for a variety of sets of numbers. (Counting, negative, rational, even, multiples, factors, etc.)
3. Locate examples of different sets of numbers on the number line.
4. Represent numbers in equivalent forms. (16=2x8=81-2=2 4)
5. Define the absolute value of a number.
6. Classify decimal representations of numbers as rational or irrational.
7. Write a decimal number in scientific notation and vice versa.

OPERATIONS

1. Multiply and divide using powers of 10.
2. Show the inverse relationship between addition and subtraction, and between multiplication and division.
3. Estimate the reasonableness of calculations when performing addition, subtraction, multiplication, and division.
4. Perform the basic operations with various sets of numbers, such as natural, whole, integer, rational, irrational, real, and complex.
5. Perform operations and simplifications involving absolute values.
6. Justify the use of calculators & computers for appropriate operations.
7. Express comparisons as ratios.
8. Round off numbers to given place values.
9. Isolate and solve formulas for any given variable.
10. Read and interpret grouping symbols.
11. Translate word phrases into mathematical expressions.
12. Evaluate trigonometric functions using tables or calculators.
13. Identify the ratios associated with the sine, cosine, and tangent of an angle.

MEASUREMENT

1. Use measuring instruments appropriate to the subject matter.
2. Explain the approximate nature of measurement.
3. Measure to the appropriate degree of accuracy.
4. Derive simple measurement formulas as in area & volume problems.
5. Apply measurement formulas.
6. Demonstrate that measurement is the repeated application of a standard unit.
7. Use the appropriate unit of measurement in applied problems.
8. Interpret and use measures of rate, such as miles per hour and meters per second.
9. Convert measurements to different units within the same system.
10. Use estimation to check the reasonableness of measurements.
11. Perform basic computations with measurements.
12. Evaluate the merits of different systems of measurements.
13. Identify the origins of different systems of measure.
14. Use calculators/computers to solve measurement problems.

GEOMETRY

1. Describe the significant properties of common geometric figures:
    a. sum of the measures of a triangle.
    b. base angles of an isosceles triangle.
    c. the Pythagorean Theorem.
    d. 30-60-90 and 45-45-90 triangle relationships.
    e. perimeter and area of triangles and rectangles.
    f. volume & area of prisms, pyramids, spheres, cylinders, cones.
2. Compare and categorize:
    a. right, supplementary, complementary, adjacent, vertical, alternate interior, and corresponding angles.
    b. parallel and perpendicular lines, rays and planes.
3. Perform the standard Euclidean constructions using compass and straight-edge.
4. Locate points and lines in two and three dimensional coordinate systems.
5. Apply the properties of congruence and similarity in two and three-dimensional situations.
6. Use LOGO, the Geometric Supposer and other appropriate computer software.
7. Describe some of the contributions made by Euclid, Pythagoras, Archimedes, and Descartes.

COLLECTION AND USE OF DATA

1. Calculate mean, median, mode, and range for a set of data.
2. Read, interpret, and construct tables and picto, bar, line, and circle graphs.
3. Identify, collect, organize, and interpret data.
4. Determine the number of possible outcomes using permutations, and combinations.
5. Analyze and solve simple one and two event probability problems.
6. Use a computer to generate, process, and analyze data.

PROBLEM SOLVING

Apply the following steps in problem solving:

1. Restate the problem.
2. Determine relevant information.
3. Determine concepts and operations to be used.
4. Apply problem solving strategies, such as:
    a) draw a diagram or make a model.
    b) make a table.
    c) find a pattern.
    d) work backwards.
    e) solve a simpler problem of the same type.
    f) use a formula, equation, or algorithm.
    g) use a calculators/computers.
5. Find a solution.
6. Check the solution.

SCIENCE TOPICS – GRADES 9-12

PROCESSES

1. Conduct safe and accurate laboratory investigations on most of the commonly known laws of science and communicate the results in a scientifically structured manner.
2. Demonstrate the ability to discover and interpret regularities by constructing and analyzing tables and graphs and entering data into various mathematical relationships.
3. From appropriately collected information hypothesize reasons WHY phenomena occur.
4. Apply scientific concepts and laboratory procedures to investigate a phenomenon.
5. Propose and justify a sound solution to a hypothetical problem, giving steps used in the reasoning process.
6. Give examples of scientific theories that have been disproved and scientific facts that have changed.

LIFE SCIENCE

1. Describe the relationship between organic compounds (such as proteins, lipids, carbohydrates) and nutritional/physiological needs.
2. Discuss the processes of cell respiration and photosynthesis, relating them to food chains and the interdependence of all living things.
3. Justify the statement that homeostasis is a universal process at all levels of organization in living systems.
4. Combining knowledge of cellular transport and cell structure, explain the on-going functioning of a cell.
5. Compare and contrast sexual and asexual reproduction including the advantages and disadvantages of each.
6. Illustrate how each individual can benefit from an understanding of the laws of heredity and the application of modern technology in the field of medical genetics.
7. Debate the ethical issues raised by recent advances in genetics, (e.g. recombinant DNA, cloning, gene therapy, eugenics, etc.).
8. Create a model to illustrate the structure of DNA and demonstrate the role of DNA in living systems.
9. Debate the validity of Darwin's theory of evolution and relate it to the concepts of adaptation and specification.
10. Devise a classification system when given diverse collections of objects.
11. Categorize according to phyla a collection of organisms representing the various kingdoms and justify the methodology.
12. Demonstrate through examples the relationship between form and function as it relates to living things.
13. Trace the changes in adaptive techniques of plants as they increase in complexity.
14. Trace the development of the major life functions through the various kingdoms.
15. Interpret the results of an experiment to investigate the effect(s) of an environmental variable on the behavior of an organism.
16. Debate environmental issues related to human influences (e.g. the use of pesticides and herbicides, endangered species, acid rain, toxic waste, pollution, etc.

17. Research a controversial issue such as world hunger, population control, euthanasia, embryo transfer, etc. Produce a paper which shows an understanding of all sides of the issue and which defends a personal position.
18. Investigate careers in various fields of biology.

PHYSICAL SCIENCE

1. Demonstrate through laboratory measurement of solids, liquids, and gasses the advantage of mass rather than volume as a measure of matter.
2. Demonstrate in the laboratory the use of physical and chemical properties to separate mixtures and compounds.
3. Investigate through quantitative experimentation several physical and chemical changes. Compare/contrast physical changes and chemical reactions, leading to the discovery of the Law of Conservation of Mass.
4. Collect data and study models which lead to the development of the Laws of Constant and Multiple Proportions.
5. Experience laboratory procedures (e.g. cloud chamber, Geiger counter, exposure of photographic plate) which lead toward the development of the atomic model of matter.
6. Investigate through experimentation various forms of energy (e.g. kinetic, potential, electrical, heath, etc.) and energy transfer leading to the discovery of the Law of Conservation of Energy.
7. Using a series of quantitative investigations with simple machines, illustrate the principles of mechanics (e.g. work, force, power, efficiency, mechanical advantage).
8. Apply the principle of Ohm's Law to everyday electrical devices. Calculate the cost of electrical usage of the devices.
9. Use a magnet, coil of wire, and galvanometer to construct a model generator. use the generator to explain the commercial production of electricity from hydro, fossil fuels, atomic fission and fusion. Debate the efficiency, cost, and consequences of each.
10. Investigate the nature and transmission of sound and light an apply these concepts to the world of work (e.g. laser, microscope, sonar, ultrasonic)
11. Utilize quantitative investigations of various heat transfer systems to develop an understanding of the concepts of specific heat, heat capacity, heat of fusion, heat of vaporization, and heat of combustion. Utilize these concepts to investigate the energy content of various fuels and foods.
12. Investigate the kinetic molecular theory and apply the theory to differentiate between heat and temperature and states of matter.

EARTH & SPACE SCIENCE

Earth Science:

1. Prepare a data table to show the nature and composition of the atmosphere. Use the data to describe weather variations, cycles, energy transfer and changes brought about by human activity.
2. Observe and measure atmospheric properties using simple instruments such as thermometers, psychometers, and barometers. Use the patterns of change in these properties to predict the next day's weather.

3. Perform experiments that demonstrate the unequal heating of land and water areas of the earth. Use the data along with the Earth's motions to describe the formation and movement of air masses, fronts, and storms.
4. Show how the contributions of Ptolemy, Copernicus, Brahe, Kepler, Galileo, and Newton have been instrumental in developing our present day model of the Universe.
5. Develop a system for measuring the positions of stars on any night. Through observations record the position of a star or groups of stars as they change during one night and over a period of several weeks. Relate this change to the motions of the Earth.
6. Compare the positions of the sun, moon, and Earth on a daily, monthly, and yearly basis. Discuss the interrelation of seasons, eclipses, phases of the moon, time, and tides to these changes in positions.
7. Compare planetary data from 1950 with that of 1980. Relate the changes to our space program.
8. Relate the spectral properties of a star to temperature, composition, motion, and evolution.
9. Use different types of maps, such as topographic, geologic, and those produced by remote sensing to show changes on the Earth's surface.
10. Explain the origin of landform and soils through a study of the processes and agents of weathering an erosion.
11. Apply the principle of uniformitarianism in determining the geologic history of individual rocks and sequences of rocks.
12. Identify and explain the evidence that supports the plate tectonic model. Use the plate tectonic model to describe the origin of rocks, volcanoes, earthquakes and mountains.
13. Relate the nature and composition of sea water and ocean sediments to the water cycle.
14. Describe how air pressure, wind, Coriolis force, and density differences produce ocean circulation.
15. Describe the interaction of sediments, energy, currents, and waves in the production of coastal features.
16. Read "Spaceship Earth" by Buckminster Fuller. Provide evidence that the earth is a closed system in space with limited resources. Plot a graph of world population growth and interpret the future of humankind in terms of exponential growth.

ENVIRONMENTAL SCIENCE

Chemistry:

1. Relate the concept of electron configuration to chemical bonding, molecular geometry, oxidation-reduction and periodicity.
2. Relate kinetic molecular theory to the physical states of matter and their behavior.
3. make stoichiometric calculations.
4. use the concept of solution equilibria to explain the differences between strong and weak acids and bases.
5. use redox potentials to explain electrochemical reactions.
6. Write correct equations to represent chemical and nuclear reactions and the accompanying energy transformations.
7. Discuss the consequences of chemical and nuclear changes.

Physics:

1. Use relationships between the laws of motion and forces to explain what happens to a person in a car that goes through acceleration, turning, and stopping.
2. Quantify work, power, and mechanical energy.
3. Construct diagrams that show how several forces act on an object.
4. Discuss how waves may be used to account for the properties of both sound and light.
5. Describe the operation of transformer and quantify the relationships that occur between the primary and secondary circuits.

Combined:

1. Relate physical and chemical principles to events and processes encountered outside the classroom.
2. Suggest an impact on society of recent advances in chemistry and physics.

SOCIAL STUDIES TOPICS – GRADES 9-12

CONTENT

2. Basic chronology of important developments and events, including those affecting women and minorities in American history
3. Analysis of cause and effect relationships of important events and developments in American history
4. Continuity and change in American institutions
5. Conflict and conflict resolution in the course of American history
6. Evidence in the investigation of American history
7. Vermont perspective in American history
8. Interpretation of American history
9. Influence of geography (landforms, bodies of water, natural resources, demographics, and climate on the course of American history
10. Significance of infrastructure (roads, navigable waterways, air routes, communications)
    Development of American economic system and its institutions (labor, corporation)
11. Development of political parties & interest groups & the role of public opinion
12. Power and distribution of resources
13. Making and interpreting constitutions
14. Political framework: legislative, executive, judicial
15. Concept of citizenship: evolution of rights & duties of citizenship
16. Decision-making at critical points in American history
17. American culture and subcultures (mores, beliefs, values): origins & transmissions
18. Cultural interaction in American history (dominant groups vs. minority groups, assimilation, isolation, diffusion)
19. Motivations of individuals and groups
20. American foreign policy
21. Basic chronology of important developments and events, including those effecting women and minorities in world history
22. Analysis of cause and effect relationships of important events and developments in world history
23. Continuity and change in various world cultures
24. Conflict and conflict resolution in various world cultures
25. Evidence in the investigation of world history
26. Interpretation of world history
27. Influence of geography (landforms, bodies of water, material resources, demographics, climate) on world history
28. Significance of place, names and map locations in world history
29. Significance of infrastructure (roads, waterways, air routes, communication)
30. Comparison and contrast of traditional command and market economic systems throughout world history
31. Influence of money & banking on the distribution of goods & services
32. Power and the distribution of resources
33. Development of world political system and ideologies
34. Comparison of legal and governmental system of world cultures
35. Concept of citizenship and the evolution of rights and duties of citizenship in world cultures

36. Decision-making at critical points in world history
37. Comparison of culture in world history
38. Cultural interaction in world history (dominant groups vs. minority groups, assimilation, isolation, diffusion)
39. Basic chronology of important developments and events, including those affecting women and minorities in Vermont history
40. Analysis of cause and effect relationships of important events and developments in Vermont history
41. Continuity and change in Vermont institutions
42. Conflict and conflict resolution in the course of Vermont history
43. Evidence in the investigation of Vermont history
44. Interpretations of Vermont history
45. Development of Vermont political system and ideologies
46. Development of political parties and interest groups and the role of public opinion
47. Power and the distribution of resources
48. Making and interpreting the Vermont Constitution
49. Political framework: legislative, executive, and judicial; federal-state relations
50. Concept of citizenship: evolution of rights and duties of citizens
51. Decision-making at critical points in Vermont history
52. Influence of geography (landforms, bodies of water, natural resources, demographics, climate) on the course of Vermont history
53. Significance of place, names and geographic locations
54. Significance of infrastructure (roads, waterways, air routes, railroads, communications)
55. Development of Vermont economic base: agriculture, tourism & light industry
56. Development of Vermont economic values: independence & interdependence
57. Critical social, political & economic issues facing Vermont
58. Vermont's cultures & subcultures (mores, norms, beliefs, values): origins & transmissions
59. Vermont-Canadian relations
60. Overview of the traditions & cultures of the Abenaki people

GEOGRAPHY

1. Locate and label on map places of historical significance
2. Assess influence of geography of course of American history
3. Evaluate the role of the growth of America's infrastructure on its economic development
4. Cite ways in which cultural differences arise as the result of geographic location
5. Locate on a map & globe the major land & water masses, continents and nations
6. Locate on a map & globe the land of origins of America' immigrant groups
7. Identify major changes in global, political boundaries from World War I to the present
8. Assess the influence of geography on the course of Vermont history; exploration & settlement, Native American settlements, development of economic base & the Green Mountain axis on political development
9. Assess the influence of Vermont's physical geography on the development of its infrastructure

HISTORY

1. List important periods in chronological order
2. Analyze cause & effect relationships of and among important events and developments
3. Trace change in one or more American institutions
4. Analyze the various civil rights movements
5. Compare & contrast similarities & differences of two historical periods
6. Analyze causes and resolutions of America's domestic socio-economic & political conflicts
7. Evaluate the legitimacy and significance of various forms of historical evidence
8. Explain how events that took place in Vermont related to important national events
9. Trace America's foreign policy and illustrate the impact of American foreign policy on domestic events
10. Compare, contrast & evaluate conflicting interpretations of historical events
11. Cite ways in which cultural differences arise as the result of historical events
12. Identify the major historical events and trends that have shaped the global development of culture
13. Evaluate the forces that can cause political, economic, social, technological & environmental change
14. Compare different cultures at specific times in world history
15. Analyze cause & effect relationships of & among important events & developments in world history.
16. Compare change & rate of change in various world cultures.
17. Analyze causes & resolutions of internal socio-economics & political conflicts in various culture & various time periods.
18. Explain how events that took place in one culture related to important global events at the same time.
19. Trace how a civilization's (nation, state, etc.) foreign policy affects its domestic policy.
20. List important periods of Vermont history in chronological order.
21. Analyze cause & effect relationships in important events and developments in Vermont history.
22. Trace continuity & change in one or more Vermont institutions.
23. Analyze causes & resolutions of Vermont's domestic, social, economic, & political conflicts.
24. Explain how events that took place globally and/or nationally related to events in Vermont.
25. Analyze & evaluate conflicting interpretation of Vermont history.

ECONOMICS

1. Trace development of the American economic system with specific reference to labor, agriculture, & industry.
2. Illustrate how the values of independent relate to American economic development.
3. Trace the cycle of boom & bust in American economic history.
4. Demonstrate the relationship between the development of capital & labor in the growth of the American economy.
5. Analyze global economic interdependence in the areas of food, energy, capital, and other critical natural resources.

6. Describe the global aspects of Vermont's economy.
7. Compare & contrast traditional command & market economic system at a period of time in world history.
8. Describe two examples of a culture's economic system changing from one model to another model.
9. Illustrate & discuss with historical examples fou7r economic concepts such as competition, cooperation, independence, and interdependence.
10. Analyze the role of local, regional, national and international trade in economic history of the world.
11. Analyze the role of agriculture, tourism, and light industry in the development of Vermont's economy.
12. Illustrate how values of independence and interdependence relate to Vermont's economic development.
13. Evaluate the reasons for the economic disparity between men and women in the world, the Unites States, and Vermont.

LAW & GOVERNMENT

1. Illustrate decision-making processes & the use of power at critical points in American history.
2. Trace the origins of U.S. Constitution, Declaration of Independence, and Bill of Rights.
3. Assess the impact of the growth of government in American life.
4. Assess the impact of judicial review of the Constitution on American life.
5. Compare and contrast the rights of citizens enumerated in U.S. Constitution and Vermont Constitution.
6. Trace the development of political parties, interest groups & public opinion in American history.
7. Analyze basic values inherit in American political ideologies.
8. Analyze alternative ways to manage international conflict.
9. Evaluate the effectiveness of United Nations' role as peacemaker.
10. Analyze the source, goals, and methods of the exercise of power by power figures in a variety of cultures during several periods of world history.
11. Define & compare various forms of government throughout world history.
12. Compare and contrast philosophies of the ideologies of government in various cultures in several periods throughout world history.
13. Define the concept of citizenship, and trace the evolution of rights and duties of citizenship in world culture.
14. Propose and defend an alternative organization to the United Nations.
15. Trace the development of Vermont's political system and political tradition.
16. Trace the development of Vermont's political parties, interest groups, and the role of public opinion.
17. Illustrate decision-making processes and the use of power at critical points in Vermont history.
18. Trace origin of the Vermont Constitution & government.
19. Assess the impact of judicial review of Vermont's Constitution on the lives of Vermonters.
20. Identify and analyze critical issues of local-state and state-federal relations in Vermont history.

21. Propose solutions to critical social, political, and economic issues facing Vermont's people and government.

SOCIOLOGY

1. Compare & contrast lifestyles of mainstream American culture in at least two different periods.
2. Compare & contrast lifestyle of mainstream American culture and a minority culture at one particular time American history.
3. Compose a list of values for incorporation in a future global political environment.
4. Demonstrate that societies create a culture as a means of adapting to environment.
5. Identify common problems in difference cultural settings.
6. Analyze how cultures have interacted with particular attention to minority vs. majority culture, diffusion, and assimilation.
7. Compare and contrast the impact of science and technology on religion, education, socialization, family life, art and music I several cultures and in several time periods.
8. Define Vermont's cultures and subcultures during several time periods.
9. Evaluate the impact of the civil rights movement and women's movement on American culture.
10. Analyze the Abenaki presence throughout Vermont's history.
11. Compare and contrast assimilation, amalgamation, and cultural pluralism as patterns of ethnic and racial relations.
12. Discuss the impact of population changes and movements upon social change in the United States, Vermont and the world
13. Analyze a social movement using sociological principles
14. Describe some possible solutions for dealing with the problems of aging in American history.
15. Analyze the impact which American values have played in causing environmental pollution and resource depletion.

ANTHROPOLOGY

1. Explain how Americans have assimilated features of other cultures and how American culture has impacted on foreign cultures.
2. Identify the subcultures within the classroom, school and community.
3. Identify the universal elements of culture.
4. Compare and contrast the beliefs and values of different cultures.
5. Cite contributions (technology, beliefs, institutions) made by America to global culture.
6. Explain how Vermonters have assimilated features of other cultures and how Vermont's culture has impacted on other cultures.

PSYCHOLOGY

1. Analyze the motivations of important individuals and groups in critical situations in American history.
2. Describe and intellectually support personal beliefs about such questions as war and peace, inequalities in the distribution of the world's resources, etc.
3. Analyze the motivation of important individuals and groups, including women and minorities, in critical situations in Vermont, the United States and world history.